ALARM-24 Series

1U Audio Alarm Monitor

Analog or Digital Inputs, Up To 24-Channels,
Loss-of-Audio/Clipping/Phase Monitoring,
with Visual and Audible Alarm Indication

Document P/N 821542 Rev-A

User Manual

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Important Safety Instructions

1) Read these instructions.
2) Keep these instructions.
3) Heed all warnings.
4) Follow all instructions.
5) Do not use this apparatus near water.
6) Clean only with dry cloth.
7) Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.
8) Do not install near any heat source such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
9) Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade or the third prong are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
10) Protect the power cord from being walked on or pinched, particularly at plugs convenience receptacles and the point where they exit from the apparatus.
11) Only use attachments/accessories specified by the manufacturer.
12) Use only with the cart stand, tripod, bracket, or table specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over.
13) Unplug this apparatus during lightning storms or when unused for long periods of time.
14) Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as when power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.
15) Do not expose this apparatus to rain or moisture.
16) The apparatus shall be connected to a mains socket outlet with a protective earthing connection.

CAUTION!

In products featuring an audio amplifier and speakers, the surface at the side of the unit, where the audio amplifier heat sink is internally attached, may get very hot after extended operation. When operating the unit excercise caution when touching this surface and ensure that external materials which may be adversely affected by heat are not in contact with it. There is a Hot Surface label (see diagram) attached to the aforementioned surface of the product.

Introduction

Congratulations on your selection of a Wohler Technologies product. We are confident it represents the best performance and value available, and we guarantee your satisfaction with it.

If you have questions or comments you may contact us at:

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Section 1

General Features and Specifications

Description

Features

Applications

Specifications

Standard Models

Other Options

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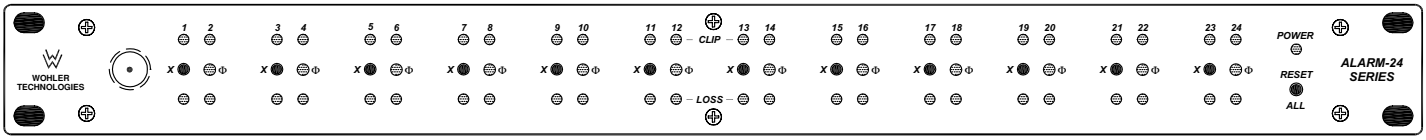
ALARM-24 Series

1U Audio Alarm Monitor



ALARM-24xS/x

Description

The Wohler **ALARM-24** audio error alarm systems provide audible and visual alarms for loss of audio, over-range (clipping), and phase/polarity reversal. When a fault condition occurs, it activates individual channel LEDs and sets off an acoustic alarm. It also energizes a rear-panel relay contact closure(s) for remote alarm. The standard **ALARM** model features twenty-four (24) channels but models featuring eight (8) and sixteen (16) channels are also available

The alarm is activated by audio levels falling outside of a pre-determined range for a pre-determined period of time. They allow for the setting of both level and time delay on a per-channel *pair* basis. Error conditions are identified on a per-channel basis. After the occurrence of an error condition, visual and audible indication is given via front panel LED signaling and Piezo buzzer activation. A Reset All button is also provided.

The unit may be easily configured using a Windows based application.

The **ALARM-24Ax/x** models monitor analog signals and feature "mini" Phoenix stye input connectors as standard. The **ALARM-24Dx/x** models monitor AES/EBU digital signals with a choice of Phoenix, BNC, or XLR input connectors. Custom variations are available.

Features

- Centralized monitoring of facility-wide signal conditions
- Only one rack space high
- Up to twenty-four channels can be monitored
- Analog and Digital (AES/EBU) audio signals supported
- Alarms for Signal Loss, Over-range (clipping), and Phase/ Polarity reversal
- Adjustable level thresholds for alarm conditions
- Audible Piezo alarm (mutable)
- Eight, twelve, or twenty-four channel models available
- Visible alarm indication via LEDs for each channel
- Individual channel pair reset buttons
- All channel clear button
- Balanced inputs on "mini" Phoenix connectors
- Software configurable with Windows based application
- Power indication LED

NOTE: Although eight (8) and sixteen (16) channel models are available, this manual specifically addresses the twenty-four channel models (**ALARM-24Ax/x** and **ALARM-24Dx/x**). However, aside from channel quantity, function and operation are identical for all **ALARM** models.

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Applications

The **ALARM-24** audio alarm monitor units are an adaptable and effective way to monitor any analog or AES/EBU digital audio application. The following are some of the applications where an **ALARM-24** unit would prove valuable.

- Radio Broadcast Station
- TV Control Room
- Remote Monitoring

Input Specifications

Input Sampling Rate:	32k - 48k Auto (AES)
Input Connector(s):	Analog (standard): "Mini" Phoenix (6-pin) Digital (standard): Phoenix (3-pin) Digital (optional): BNC or XLR (3-pin)
Digital Input Impedance: (AES/EBU)	Phoenix: 110 Ω, balanced XLR: 110 Ω, balanced BNC: 75 Ω, unbalanced
Analog Input impedance:	"Mini" Phoenix: >10K Ω, balanced

Power Specifications

AC mains power:	100-250 VAC, 50/60 Hz universal input, auto switching
Power consumption:	25W

Physical Specifications

Dimensions (H x W x D):	1.75 x 19 x 8 inches 45 x 483 x 203 mm
Weight:	6 lbs./2.7 kg

Standard Models

The *standard* **ALARM** model features twenty-four (24) channels, but models featuring eight (8) and sixteen (16) channels are also available as options. Below are the model names as denominated for the **ALARM-24** models.

ALARM-24AM/P: Analog inputs, Mono, on Phoenix connectors
ALARM-24AS/P: Analog inputs, Stereo, on Phoenix connectors
ALARM-24DM/P: Digital (AES) inputs, Mono, on Phoenix connectors
ALARM-24DS/P: Digital (AES) inputs, Stereo, on Phoenix connectors
ALARM-24DM/B: Digital (AES) inputs, Mono, on BNC connectors
ALARM-24DS/B: Digital (AES) inputs, Stereo, on BNC connectors
ALARM-24DM/X: Digital (AES) inputs, Mono, on XLR connectors
ALARM-24DS/X: Digital (AES) inputs, Stereo, on XLR connectors

Model Option Naming Key

1st Appended Letter..... Signal { **A** = Analog, **D** = Digital }

2nd Appended Letter..... Monitor { **M** = Mono, **S** = Stereo }

3rd Appended Letter... Connector { **/P** = Phoenix*, **/B** = BNC (Female), **/X** = XLR (3-Pin Female) }

***Analog** models use 6-pin "mini" Phoenix connectors, **Digital** models use standard 3-pin Phoenix connectors.

NOTE: In the model names *throughout this manual*, the unspecified stereo/mono is indicated by "**x**" and unspecified connector option is indicated by "**/x**".

Other Options

Other options are available by special order including:

- Custom combinations of input connectors
  - 26-segment high resolution displays
  - 53-segment high resolution displays
- Eight (8) and sixteen (16) channel models

Other custom options are possible. Call your dealer or Wohler Technologies to discuss your specific needs.

Units are designed to meet, at time of manufacture, all currently applicable product safety and EMC requirements, such as those of CE. Features and specifications subject to improvement without notice.

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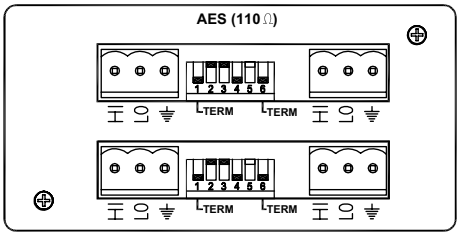
Rear Panel Configurations

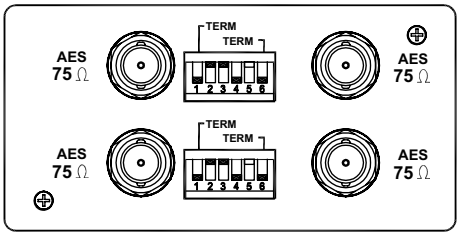
The 1U **ALARM-24** rear panels are comprised of modular panel sections. In any given **ALARM-24** model, three of the modular panel sections have the audio input connectors, with the fourth remaining section containing the alarm controller features. This arrangement permits mixing of different types of input modules, although such mixes are considered special order items.

The following illustration shows three types of input panel section modules (two digital and one analog) available for use in the **ALARM-24** series. **Analog** models are referred to with an "**A**" appended to the standard product name and **Digital** (AES) models are referred to with a "**D**" appended. **Stereo** models append an "**S**" after the input type and **Mono** models append an "**M**". Models featuring **Phoenix** connector inputs use a "**P**" as the last letter of the model name. **BNC** connector inputs use a "**B**". **XLR** connector inputs use an "**X**". See page 5 for a list of all *standard* models in the **ALARM-24** series.

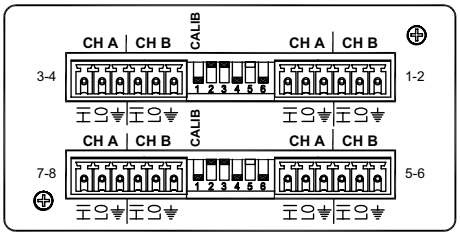
Note: Models configured with **XLR** connectors are limited to 12 channels (or less) due to space constraints when using these larger connectors.



Phoenix Input Modular Section for ALARM-24Dx/P (Digital)

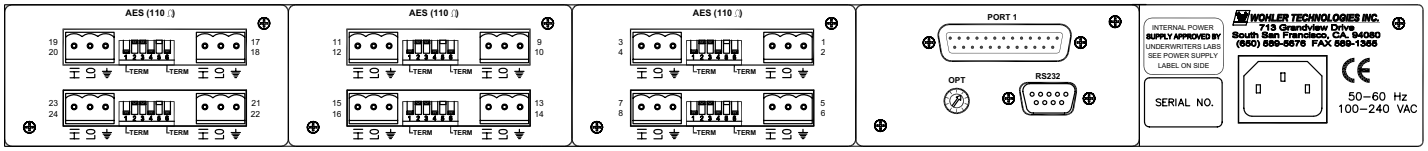


BNC Input Modular Section for ALARM-24Dx/B (Digital)

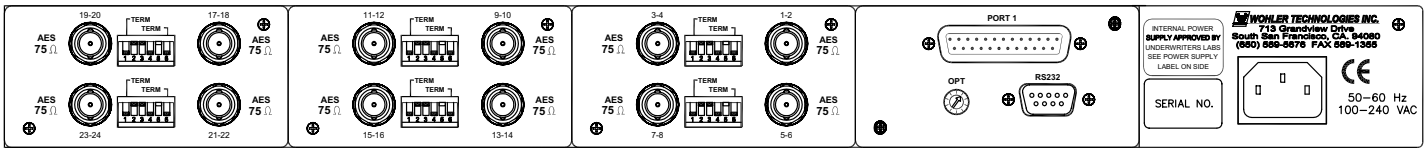


"Mini" Phoenix Input Modular Section for ALARM-24Ax/P (Analog)

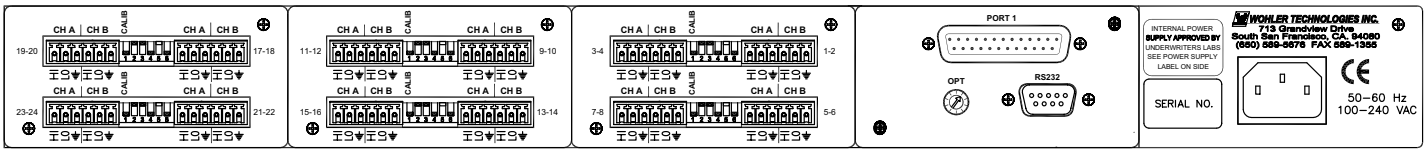
Below are illustrations showing three standard configurations of the **ALARM-24** series rear panels.



ALARM-24Dx/P Rear Panel (24-Channel Digital with Standard Phoenix Inputs)



ALARM-24Dx/B Rear Panel (24-Channel Digital with BNC Inputs)



ALARM-24Ax/P Rear Panel (24-Channel Analog with "mini" Phoenix Inputs)

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Section 2

Operation

Installation

Alarm Sounder Enable/Disable Instructions

Front Panel Features

Rear Panel Features

Wohler Alarm Profile Editor Installation and Operation

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Installation

Mounting

The unit should be mounted where convenient for operating persons, ideally at approximately eye level for best visual monitoring.

Heat Dissipation

No special considerations for cooling are necessary as long as the ambient temperature inside the rack area does not exceed approximately 40°C (104°F).

Mechanical Bracing

The chassis is securely attached to the front panel at five points along its surface, not just at the four corners of the chassis ears. This feature will reduce or eliminate rear bracing requirements in many mobile/portable applications. The weight of internal components is distributed fairly evenly around the unit.

Audio Connections

Connection of the audio feeds is straightforward. Please refer to the system interconnect block diagram on pages 22 and 23 for clarification of the general signal paths into the **ALARM-24** series units.

Care should be exercised to avoid mis-matched cable types and other similar causes of undesired reflections in RF signal systems.

Electrical Interference

As with any audio equipment, maximum immunity from electrical interference requires the use of shielded cable; however, satisfactory results can sometimes be obtained without it. The internal circuitry common is connected to the chassis.

AC Power

The unit's AC mains connection is via a standard IEC inlet, with safety ground connected directly to the unit's chassis. The universal AC input (100-240VAC, 50/60Hz) switching power supply is a self-resetting sealed type, with automatic over-voltage and over-current shutdown. There is no user-replaceable fuse in either the primary or secondary circuit.

Alarm Sounder Enable/Disable Instructions

All **ALARM-24** Series units feature a Piezo **Alarm Sounder** located on the front panel (**Item 1**, page 10). This sounder produces an audible alarm when the configured alarm threshold has been exceeded. This sounder may be disabled or enabled using the instructions below.

To **ENABLE** the acoustic sounder in the unit, perform the following steps on the front panel:

1) Hold down the **Reset All** button (**Item 7**, page 10)
2) Press and *release* the **Channel 3 Reset Alarm** button (**Item 3**, page 10)
3) Release the **Reset All** button

To **DISABLE** the acoustic sounder in the unit, perform the following steps on the front panel:

1) Hold down the **Reset All** button (**Item 7**, page 10)
2) Press and *release* the **Channel 1 Reset Alarm** button (**Item 3**, page 10)
3) Release the **Reset All** button

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Front Panel Features

Please refer to the example in **Figure-2a** on the following page to familiarize yourself with the front panel features of the **ALARM-24** Series units. The following sections describe these functions and are referenced, by number, to **Figure-2a**.

1 Alarm Sounder

The Piezo **Alarm Sounder** produces an audible alarm when the the alarm threshold has been exceeded. See page 9 for instructions for how to disable or enable the **Alarm Sounder**.

2 Loss (of Audio) Indication LED

This RED LED lights up to indicate that the **loss of audio** alarm threshold has been exceeded in the associated channel.

3 Channel Reset Button

ALARM-24xS/x: For the **stereo** product, this momentary push-button **resets** the alarm for the associated channel *pair*.

ALARM-24xM/x: For the **mono** product, this momentary push-button **resets** the alarm only for each *single* channel.

4 Phase/Polarity Reversal Indication LED OR Channel Reset Button

ALARM-24xS/x: For the **stereo** product, this is a YELLOW LED, which lights up to indicate that the **phase** alarm threshold has been exceeded in each associated channel *pair*.

ALARM-24xM/x: For the **mono** product, this is a **Channel Reset Button** (see **Item 4**, above), which **resets** the alarm for each *single* channel.

5 Clipping Indication LED

This RED LED lights up to indicate that the **audio clipping** alarm threshold has been exceeded in the associated channel.

6 Power Indication LED

This GREEN LED lights up to indicate the **ALARM-24** model is connected to operational mains power.

7 Reset All Push-Button

This momentary push-button simultaneously **resets** the alarm for ALL the channels in the unit.

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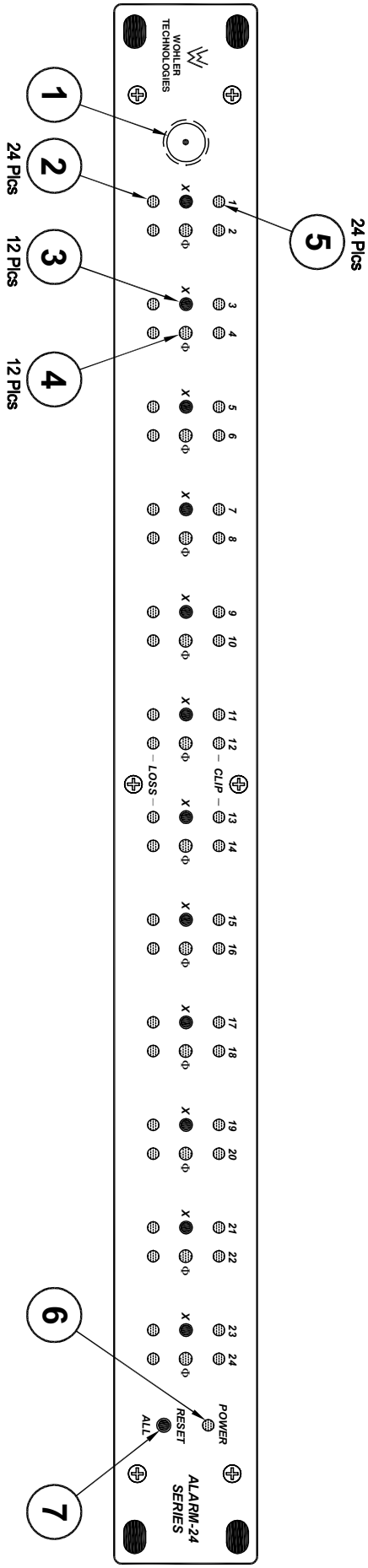

Figure-2a: Front Panel Features (ALARM-24xS/x Example)

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Rear Panel Features

Please refer to **Figure-2b** on the following page to familiarize yourself with the rear panel features of the **ALARM-24** Series units. The following sections describe these features and are referenced, by letter, to **Figure-2b**.

A Digital (AES) Audio Input Connectors

(ALARM-24Dx/x Only)

Each input connector receives an AES digital signal from which two channels are derived.

A1 Phoenix Connectors (Standard)

These **Phoenix** (or **XLR**) connectors are configured for a *balanced* (110 Ω impedance) connection. Channel numbers are displayed on a label to the side of each connector and correspond to the channel numbers above the associated LED indicators on the front panel. Connector pinout information is silk-screened just below each connector.

A2 BNC Connectors (Optional)

These **BNC** connectors are configured for an *unbalanced* (75 Ω impedance) connection. Channel numbers displayed on a label above *or* below each connector and correspond to the channel numbers above the associated LED indicators on the front panel.

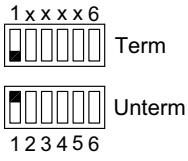
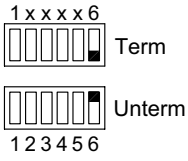
B Input Termination DIP Switch

(ALARM-24Dx/x Only)

This DIP switch sets the **Termination** for the input connectors. Each DIP switch module affects only the four channels (two input connectors) within the section in which it is located. See below for setting information.

Switch sections **1** (left connector) and **6** (right connector) respectively set the termination for the connector inputs in each 4-channel input section. The respective DIP switch section should be moved to the **UP** position to **UNTERMINATE** the connector if the input signal is fed to downstream equipment. The respective DIP switch section should be moved to the **DOWN** position to **TERMINATE** the connector if the input signal is *not* fed to downstream equipment. The factory **default setting** is **TERMINATED** for each input connector. See diagam below for settings.

ALARM-24 Termination DIP Switch Settings

Left Side Input Termination	Right Side Input Termination
	

Note: Positions 2, 3, 4, & 5 of DIP switch are *not* functional

C Analog Audio Input Connectors

(ALARM-24Ax/P Only)

The Analog units have *balanced* (>10K Ω impedance) inputs terminated in 6-pin **"mini" Phoenix** connectors. There are two signals; one signal to the *left* three pins (**CH A**) and the second signal to the *right* three pins (**CH B**). There are two input connectors per input section (4 channels). Channel numbers are displayed on a label to the side of each connector and correspond to the channel numbers above the associated bargraph meters on the front panel. Pin-out information is silk-screened on the rear panel directly below each connector.

D DIP Switch Module

(ALARM-24Ax/x Only)

This DIP switch is not functional in the **ALARM-24Ax/x** Series models.

(Continued)

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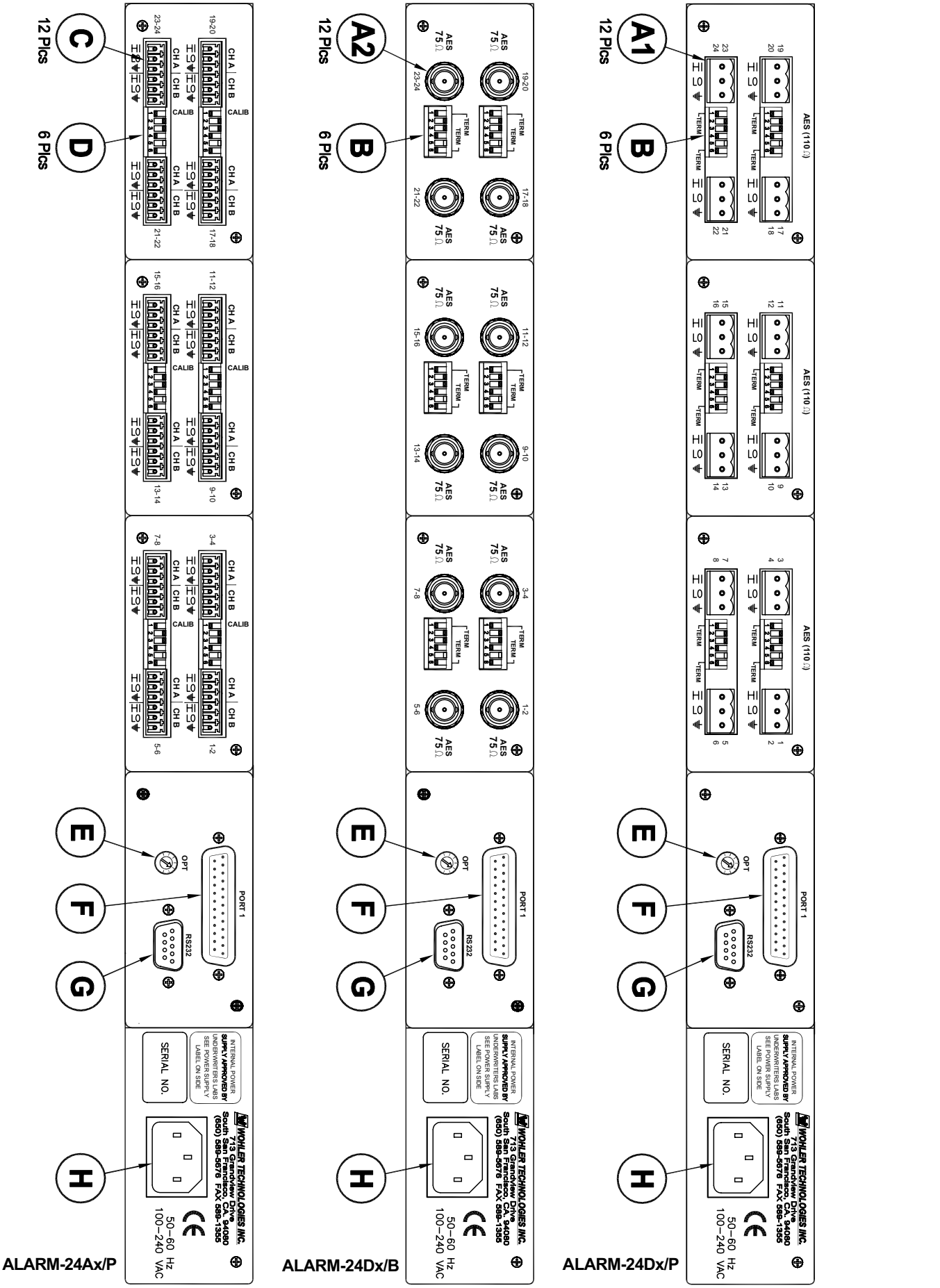

Figure-2b: Rear Panel Features

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Rear Panel Features

(Continued)

E Option Select Switch

This 10-position BCD rotary switch is used to set operation of the unit. It can be accessed using a small flathead screwdriver or similar tool. Set to **position 3** for *normal* operation. See table below for settings.

Note: For **position 2,** see page 17 (**Wohler Alarm Profile Editor Installation and Operation: Equipment hookup and Data Download**) for instructions for downloading alarm threshold settings.

BCD Option Rotary Switch - 10-Position	
Position	**Function**
0	Factory Only
1	Factory Only
2	Alarm Threshold Download
3	Normal Operation
4	Not Used
5	Not Used
6	Not Used
7	Not Used
8	Not Used
9	Not Used

F Port 1 Connector

This DB-25 connector (Port 1) is used to convey alarm conditions to outboard equipment. This port has isolated contact closures which indicate Alarm conditions for the assiciated channel pairs. These contacts are normally open and close on alarm. A summary contact pair exists between **pins 1** and **14**. If any relay pair in the unit closes, the summary contacts also close. **Example:** If **channel 15** or **16** trips into alarm, a contact closure will occur between **pins 9** and **21** for the duration of the alarm.

Port 1 DB-25 Pinout			
Pin#	**Function**	**Pin#**	**Function**
1	Unit Alarm A		
2	CH 1-2 A	14	Unit Alarm B / CH 1-2 B
3	CH 3-4 A	15	CH 3-4 B
4	CH 5-6 A	16	CH 5-6 B
5	CH 7-8 A	17	CH 7-8 B
6	CH 9-10 A	18	CH 9-10 B
7	CH 11-12 A	19	CH 11-12 B
8	CH 13-14 A	20	CH 13-14 B
9	CH 15-16 A	21	CH 15-16 B
10	CH 17-18 A	22	CH 17-18 B
11	CH 19-20 A	23	CH 19-20 B
12	CH 21-22 A	24	CH 21-22 B
13	CH 23-24 A	25	CH 23-24 B

G Serial Control Connector

This connector is used for **Remote Control** and for software upgrades of the product. See page 20 (**RS232 Status and Control**) for more information about this connector. See table below for pinout information.

RS232 Serial Control DB-9 Pinout (DCE)	
Pin#	**Function**
1	DCD
2	Rx Data
3	Tx Data
4	DTR
5	Ground
6	DSR
7	RTS
8	CTS
9	Not Used

Note: Pins 1, 4, and 6 are linked and pins 7 and 8 are linked.

H Power Input Connector

Attach a standard IEC-320 power cord between this connector and mains power (100 - 240VAC nominal, 50/60 Hz). The front panel **Power Indication LED** (**Item 6**, page 10) will glow GREEN to indicate operating voltages are present.

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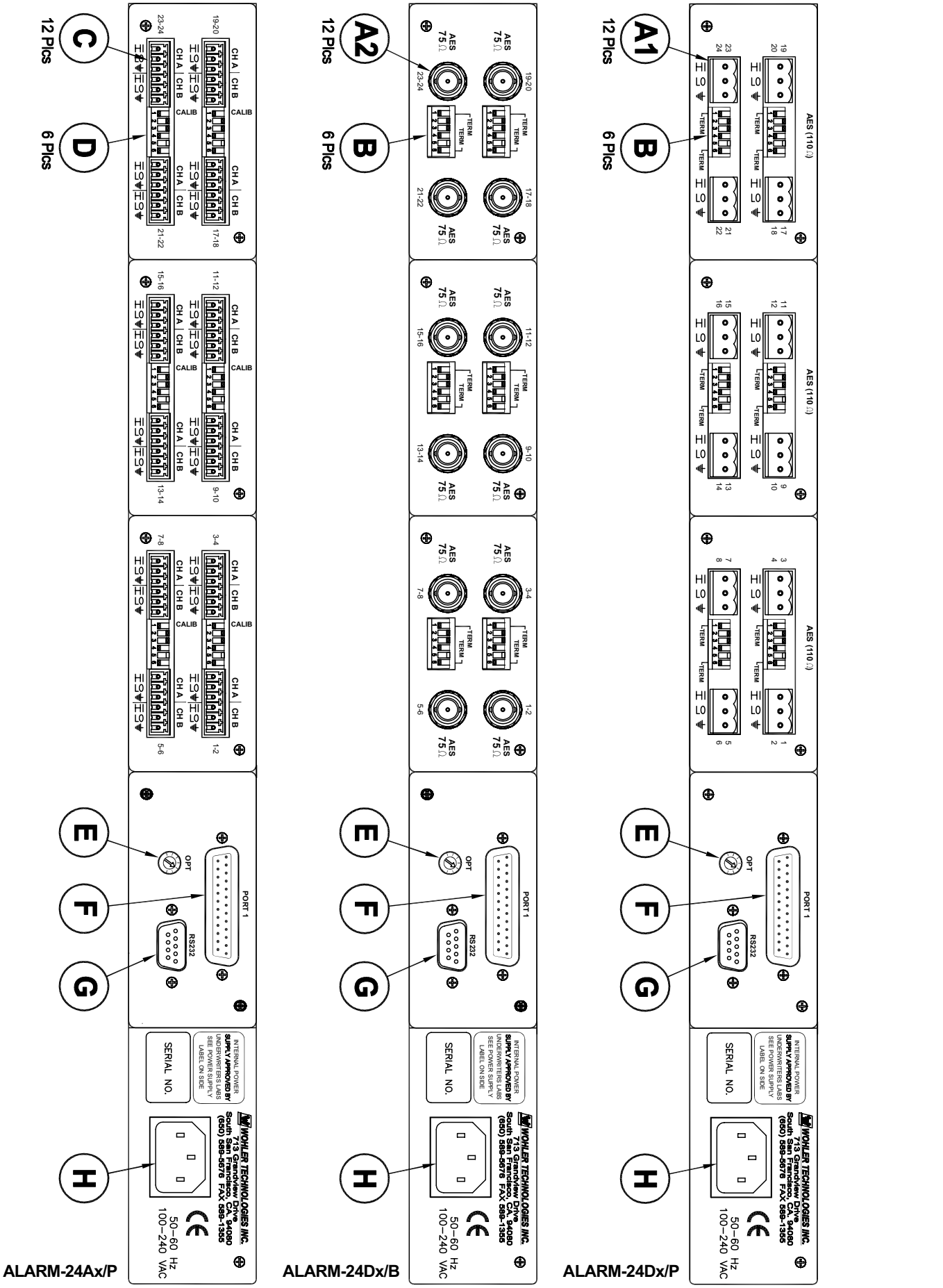

Figure-2b: Rear Panel Features

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Wohler Alarm Profile Editor Installation and Operation

Background

The Wohler **Alarm Profile Editor** is a Windows application designed to allow the user of the Wohler Alarm products to be able to change alarm trip thresholds.

The application targets the following operating systems: WIN 95, WIN 98, WIN 2000, WIN NT4.0 and WIN XP.

The application is distributed with product on CD-ROM, or may be downloaded from the Wohler Web site (see Factory for details).

A Wintel architecture machine with at least 10M bytes of hard disk space and a spare COM1 port are required for this application to be installed correctly.

Installation

The installation package is supplied as three files:

- **setup.exe**
- **setup.1st**
- **wohler_alarm_profile_editor.cab**

Load all three files into a temporary directory (c:\temp on most machines) then start the installation process by running setup.exe (from Windows Explorer, double click on Setup.exe).

The application installer will take you through the process step by step. It is recommended that you accept defaults where possible. The default installation path is **c:\Program Files\Wohler_Alarm_Profile_Editor**.

Application Operation

Execute the **Alarm Profile Editor** by selecting : **Start Menu : Programs : Wohler_Alarm_Profile_Editor : Wohler_Alarm_Profile_Editor**.

Select **Stereo** or **Mono** mode - depending upon how your unit was ordered.

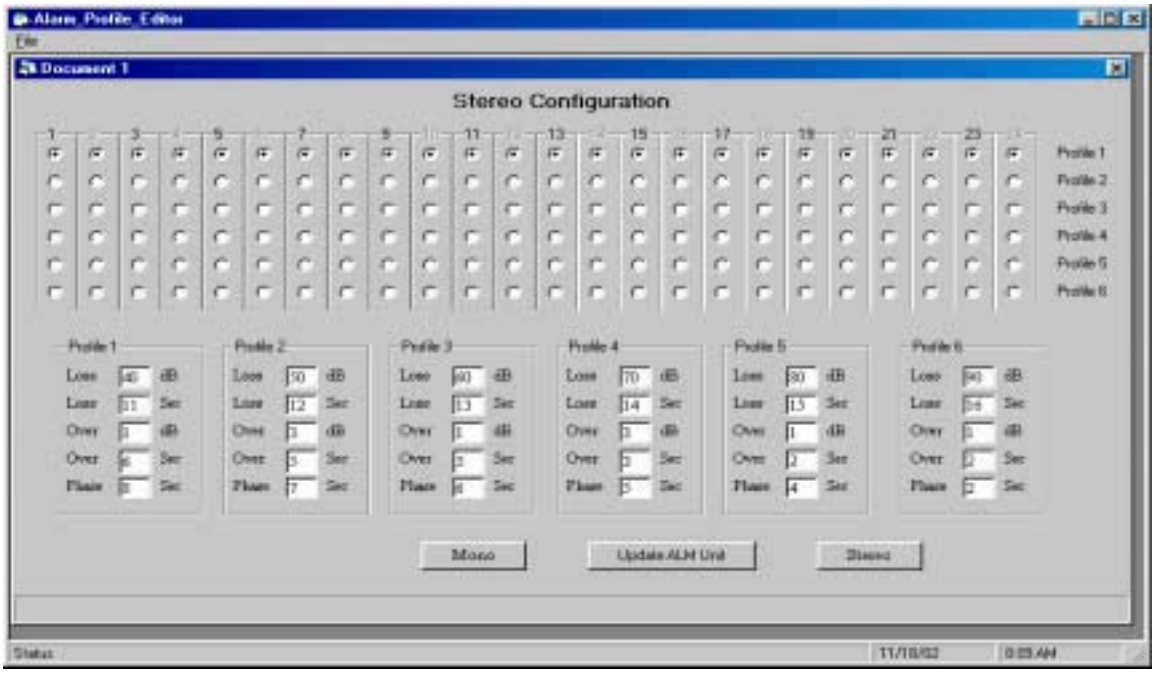
Note: For Analog units, Full Scale Input (0 dBFS) is +24dBu.

Example 1: To set an Analog unit to an Audio Loss threshold of -10 dB ref given a studio reference level of 0 dBu, set the Loss parameter to 34 dB in the **Alarm Profile Editor**.

Example 2: To set an Analog unit to an Audio Loss threshold of -20 dB ref given a studio reference level of +4 dBu, set the Loss parameter to 40 dB in the **Alarm Profile Editor**.

Stereo: Alarm Profile Editor Screen

In **Stereo**, the **Main Editor Screen** is similar to the following:



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Wohler Alarm Profile Editor Installation and Operation

Stereo: Alarm Profile Editor Screen (Continued)

Each Alarm Profile consists of five parameters:

Loss Amplitude: A threshold in dB (with respect to **Digital Full Scale**) below which **Silence** is deemed to be active.

Loss Duration: A qualifying period that the **Loss Amplitude** criteria has been met. When **Loss Amplitude** has been met for **Loss Duration** then a **Loss of Audio** alarm condition has been met. The unit will then trip into and report that alarm.

Over(load) Amplitude: A threshold in dB (below **Digital Full Scale**) above which **Over** is deemed to be active.

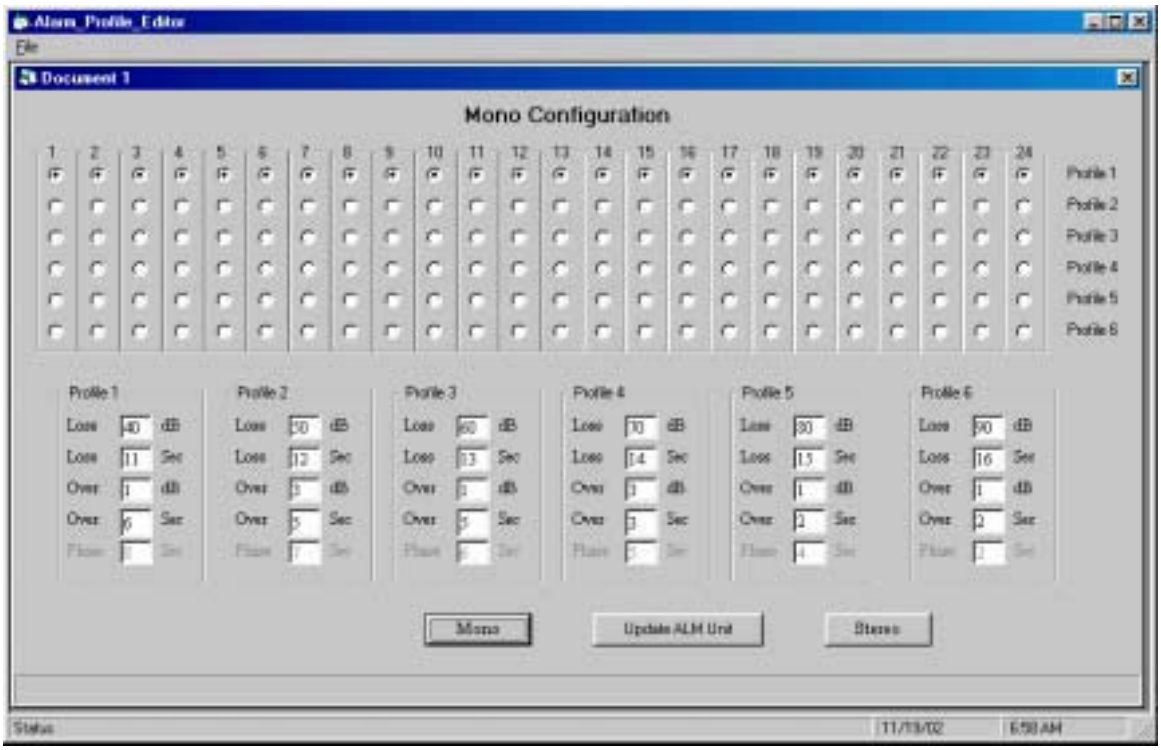
Over(load) Duration: A qualifying period that the **Over Amplitude** criteria has been met. When **Over Amplitude** has been met for **Over Duration** then an **Overload Audio** alarm condition has been met. The unit will then trip into and report that alarm.

Phase Duration: A period that average signal out of phase has to be met to trip an **Audio Phase** alarm condition.

Notice that the odd and even channels are "ganged together" for **Stereo** operation. By selecting profile **2** for channel **3**, channel **4** also has that profile assigned to it.

Mono : Alarm Profile Editor Screen

In **Mono**, the **Main Editor Screen** is similar to the following:



Unlike Stereo, each channel is independent and the Phase option is not enabled.

Equipment Hook up and Data Download

- A "straight through" cable should be used for hookup between the PC running the **Alarm Profile Editor** and the unit receiving the profile.
- To put the Wohler Alarm unit into **Load Profile** mode, remove power, set the rear panel **Option Select** BCD switch (**Item E**, page 14) to position **2**, reapply power. The unit is then ready to receive its' new set of profiles.
- Click on the **Update ALARM Unit** button and the profile will load. The process should take less than a minute. During the download process, the text **Status** (bottom left of the screen) will be replaced with a single line progress report of the download.
- Once the download is compete, remove power from the Alarm Unit, return the **Option Select** BCD switch to its previous setting then reapply power.
- Download is complete.

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Section 3

Technical Information

- RS232 Status and Control
- ALARM-24 Internal Settings - Channel Address
- ALARM-24A (Analog) Interconnect Block Diagram
- ALARM-24D (Digital) Interconnect Block Diagram

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RS232 Status and Control

1) Interface Type

The RS232 connector on the ALARM units is a female DB9, configured for Data Communications Equipment (DCE). This port will connect directly to a COM port on an IBM compatible computer with a "straight through" 9-way RS232 cable.

2) Serial Form

Data is sent and received without any handshaking using the following data format:

Rate: 9600 Baud
Format: 8 bits
Stop Bits: 1
Parity: None

3) Messages from ALARM unit

Data is sent out of the ALARM units formatted as ASCII Hex, most significant data first, length is 32 bits, the string is terminated by Carriage Return, Line Feed.

The 32 bit message contains an 8 bit Command Code (B31..24) and 24 bits of Channel Data (B23..0).

Command Codes:

00NNNNNN	Carrier Loss Alarm
01NNNNNN	Audio Loss Alarm
02NNNNNN	Phase Alarm
03NNNNNN	Over(load) Alarm

Channel Data:

MM000001	Channel 1
MM800000	Channel 24

B0 set represents Channel 1 Alarm
B1 set represents Channel 2 Alarm
B2 set represents Channel 3 Alarm
B22 set represents Channel 23 Alarm
B23 set represents Channel 24 Alarm

Where MM indicates 1 byte of Command code and NNNNNN indicates 3 bytes of channel data.

Examples:

ALARM unit reports that Channel **3** has just tripped into **Phase Alarm**. Unit sends out the following message: **02000004<cr><lf>**.

ALARM unit reports that Channel **23** has just tripped into **Overload Alarm.** Unit sends out the following message: **03400000<cr><lf>**.

4) Messages to ALARM unit

Data is sent to the ALARM unit using the same data format as in part 3, above. The initial command code the unit can accept is 80, which is channel reset. Any number of channels may be reset using this one command:

Command Code:

80NNNNNN	Channel Reset

Channel Data:

80000001	Channel 1 Alarm Reset
80800000	Channel 24 Alarm Reset
80FFFFFF	All channels Alarm Reset

5) Notes

1) Hexadecimal notation is indicated in this section.

2) The ALARM units only generate and respond to RS232 commands when the **Option Select Switch** (**Item E**, page 14) is set to **Normal Operation** (DIP section **3**).

3) The ALARM unit will only generate messages when a check of state occurs with the unit, i.e., **Acquisition** or **Loss of** and **Alarm** state.

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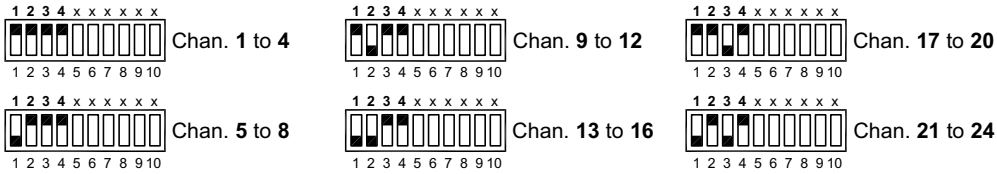
ALARM-24 Internal Settings - Channel Address

ALARM-24 Internal 10-Position DIP Switch Settings

Channel Address (Factory Set)



NOTES:

1) DIP switch is located on Analog Input PCB (919174) or Digital Input PCB (919175).
2) DIP sections 5, 6, 7, 8, 9, and 10 are *not used*.

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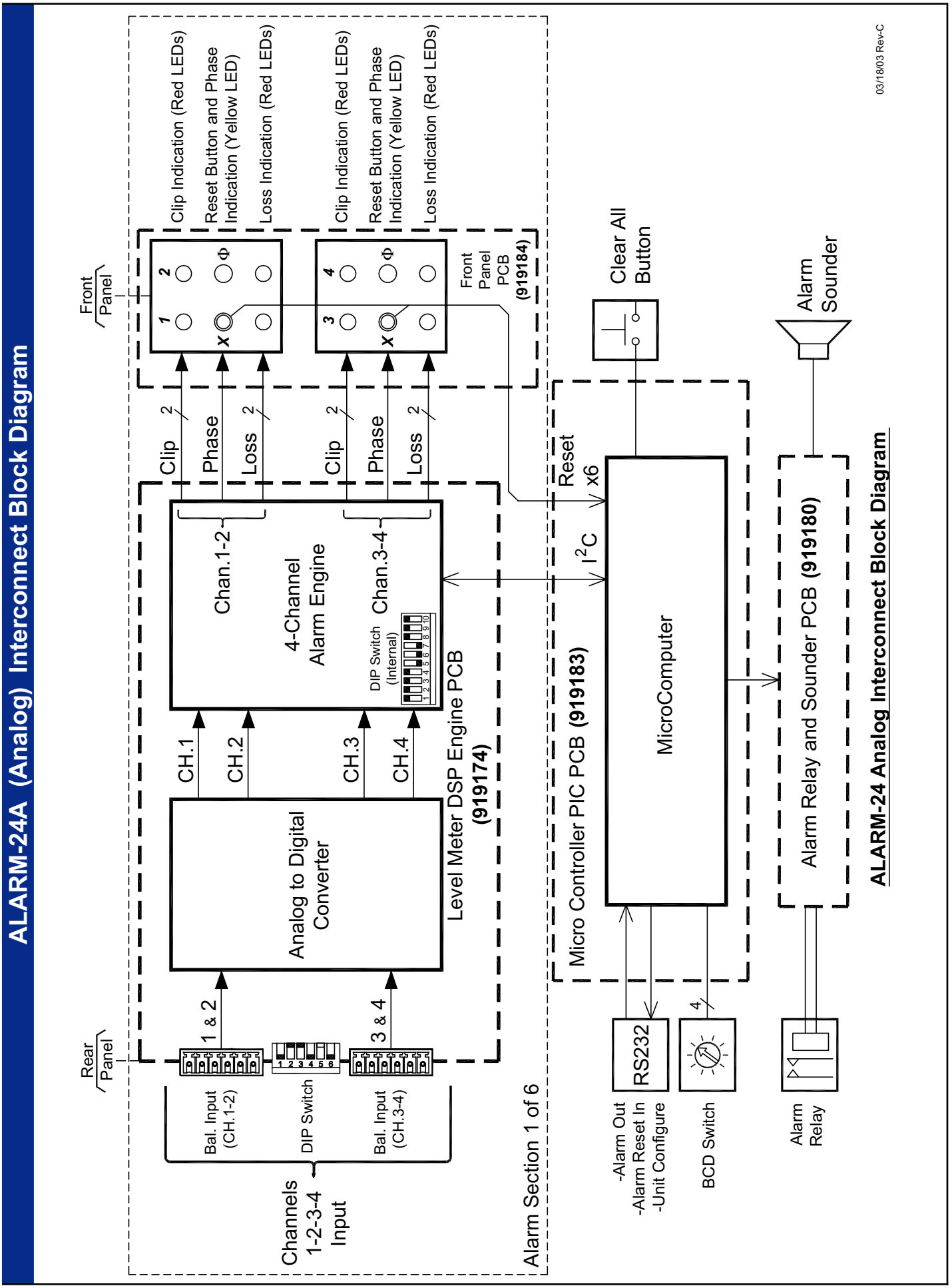

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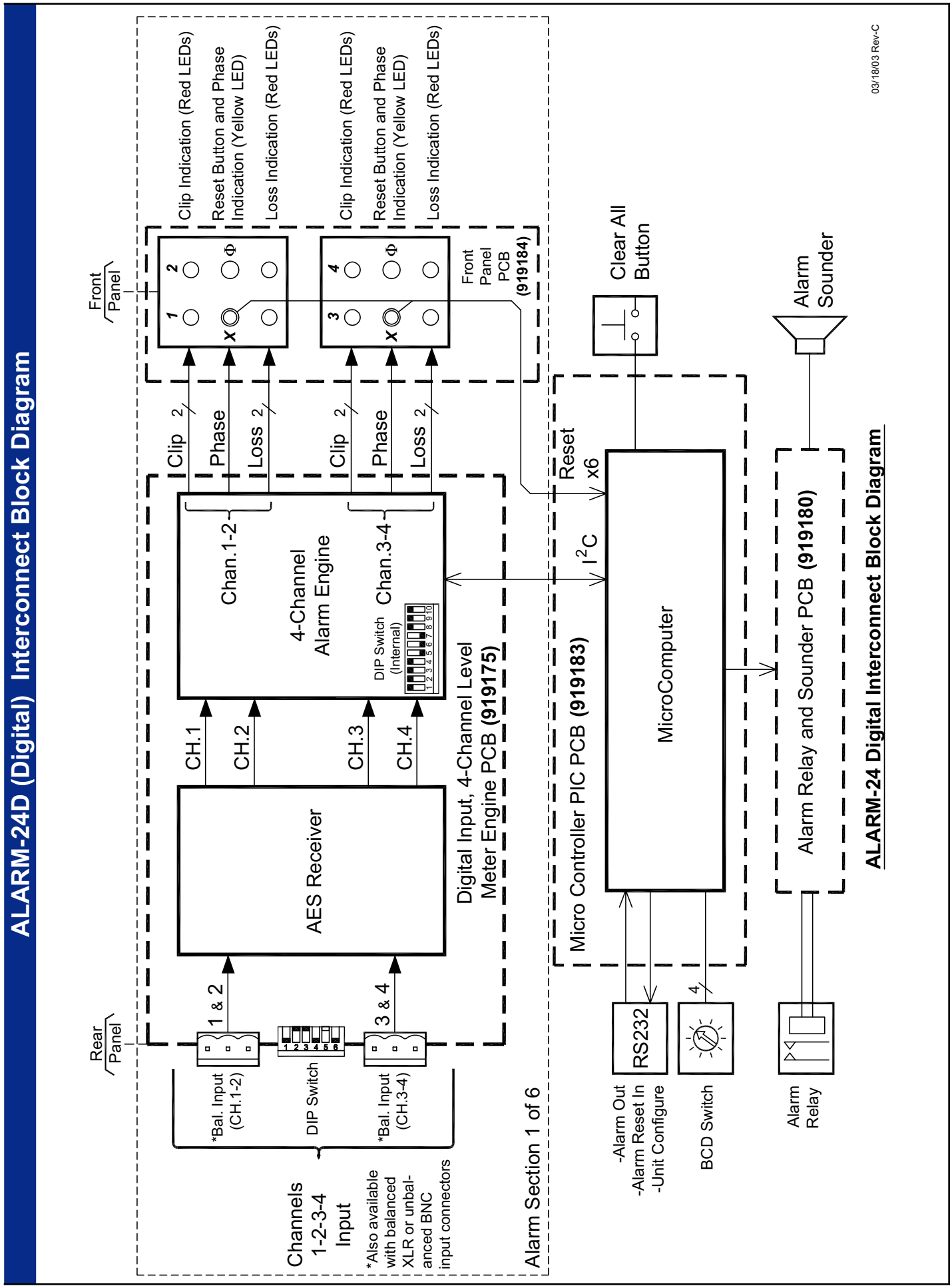

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